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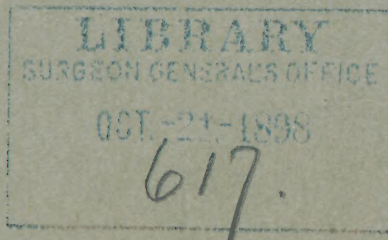
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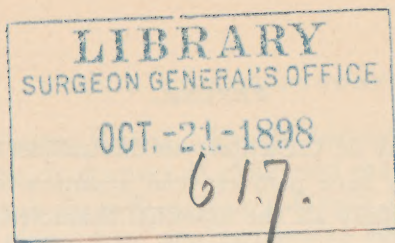
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## CASES OF HERNIA OF THE BLADDER MET WITH DURING OPERATIONS FOR INGUINAL AND FEMORAL HERNIA.

BY CHRISTIAN FENGER, M.D.,  
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UNTIL the last decade, hernias of the bladder were considered as of comparatively rare occurrence; but since the radical operation for hernia has been revived, and has become so common as to be almost an everyday operation, the bladder has been met with quite frequently in the course of these operations. Although the bladder has been encountered in almost all forms of hernia, it is practically only the femoral and inguinal hernias that we have to deal with in this regard.

In 1891 Siegel<sup>21</sup> collected 73 cases of hernia of the bladder, 48 of which were inguinal; since that time 13 more cases have been reported—by Roth,<sup>19</sup> 2 by Walther<sup>23</sup> (published by Bourbon),<sup>2</sup> and 1 each by Postempski,<sup>17</sup> Leszinsky,<sup>15</sup> Guelliott,<sup>5</sup> Israel<sup>10</sup> (published by Feilchenfeldt), Thiriar,<sup>22</sup> Reverdin,<sup>18</sup> Kummer,<sup>12</sup> and Polaillon, to which I add my case. This makes in all 62 cases of inguinal hernia of the bladder. In 1893 Guépin<sup>6</sup> collected 8 cases of femoral hernia of the bladder, 1 case being reported by each of the following operators: Levret, Habs,<sup>9</sup> Güterbock,<sup>7</sup> Cooper, Aue,<sup>1</sup> Schoonen,<sup>20</sup> and 2 by Lang.<sup>13</sup> To these I add my 2 cases, making in all 10 femoral hernias of the bladder.

In the great majority of these cases the hernia was not suspected before operation. There has been so much difficulty in recognizing the bladder even during operation, that in most of the cases the bladder was wounded before being discovered; on

this account many of the writers on this subject during the last five or six years have paid especial attention to and have described very carefully all the essential characteristics of hernia of the bladder.

One of the chief points in vesical hernias is the relation of the hernial sac to the bladder, which again is identical with the relation of the peritoneum to the protruding part of the organ. This has been clearly yet briefly described by Dieffenbach in 1848, as follows: "Hernias of the bladder have sometimes a hernial sac, at other times none. If that part of the bladder which has a peritoneal covering prolapses, there is a hernial sac. If a part of the bladder uncovered by peritoneum protrudes, the sac is wanting. If a portion of the bladder on the border line between the intra- and extra-peritoneal surface comes out, then there is half a hernial sac." (That is, a hernial sac is present on half the prolapsed surface of the bladder, and on the other half the sac is absent.)

The location of the hernia is invariably in the medial and lower part of the respective rings, inguinal as well as femoral; if an intestinal hernia is also present its contents are situated above and to the external side of the vesical hernia.

I. We most frequently find the peritoneum of the sac covering only a portion of the prolapsed bladder, its upper anterior surface is clad with peritoneum, but the inferior medial portion is not. The sac, whether empty or filled, is ordinarily larger than the prolapsed portion of the bladder; it extends further out or lower down, so that the bladder is found as a small mass at the neck of the sac only, on its inferior medial aspect.

II. Less frequently a complete sac is found; that is, the protruding bladder is entirely covered by peritoneum, as in my case of inguinal hernia.

CASE I. *Synopsis.* *Left femoral hernia; no distinct symptoms of hernia of the bladder; radical operation; bladder not recognized and opened; bladder wound sutured and anchored to deep portion of wound; recovery without leakage.*—Miss L. S., school-teacher, aged twenty-three years, was admitted to the German

Hospital, February 3, 1894. Family history negative. Aside from the ordinary diseases of childhood she was healthy. At the age of fifteen she suffered from chlorosis, which persisted for four years. A year later she had uterine inflammation, and in August, 1893, a mild attack of scarlatina. Following this she had hysterical attacks, during which she cried and sobbed so much that she thought it might be the cause of the present disease. In October, 1893, she noticed a soft tumor in the left femoral region, which was somewhat tender and could not be reduced by pressure. A few weeks later she began to have pain in the tumor, which increased until it became almost intolerable. Patient says that even when a child she would have to be awakened during the night to pass water. As she grew older she was obliged to get up once or twice in the night. When she was excited she would have to urinate more frequently. She never had any pain before, during or after urination.

Upon examination I found an irreducible left femoral hernia the size of a walnut.

Operation, February 5, 1894. The A. C. E. mixture was employed as an anæsthetic on account of albuminuria. An incision three inches in length was made below and parallel to Poupart's ligament, across the crural opening. Blunt dissection was then made down to the empty sac, which was doubly ligated and the end cut off. Reduction of the stump was impossible. A diffuse lipoma, or rather a conglomeration of adipose tissue, was found on the internal surface and dissected off. When this was cut off another sac-like cavity was opened, through which a probe passed into the abdominal cavity. I believed this to be the sac of a properitoneal hernia, but as I found, after dissecting off more adipose tissue, another sac, I searched for the relation between them, and found that they all communicated and were folds of the abdominal parietal peritoneum, which was so loosely attached to the surrounding peritoneum that it simulated an independent hernial sac or diverticulum, but was in reality a portion of the first cavity, which was curiously folded upon itself.

Upon the dissection of more adipose tissue a third peritoneal

sac was opened. Still deeper, on the internal surface in the medial portion of the ring was an ovoid body, whitish, elastic, the size of an almond. Upon traction this could be pulled out an inch or more, but no neck could be seen, as the mass filled the entire ring. It looked like an ovary or the anterior surface of a small testicle, but manipulation with the fingers proved that it was a thin-walled empty sac whose walls moved against each other. As I supposed this to be a fourth fold, I cut it open for about two inches. As its surface, although whitish and smooth, presented a slightly different appearance from the peritoneal surface of an ordinary hernial sac, I suspected that it might be the bladder, and my suspicion proved correct, as a sound in the bladder met the finger tip introduced through the opening in the supposed sac. No urine escaped, as the bladder had been emptied by catheter. The bladder wound was immediately united by a row of Lembert sutures of catgut, reinforced by another row. In the centre a heavy silk suture was inserted, with the ends left long to anchor the bladder in the wound, and thereby render the abdomen safe against urinary infiltration. The opening into the peritoneal cavity was then united, the wound packed with iodoform gauze, a permanent soft catheter inserted in the bladder, and the usual dressings applied.

A week later the anchor suture was removed. The peritoneal wound was healed. Two weeks after the operation the permanent catheter was removed and the patient catheterized every three hours. There was at no time any leakage of urine through the wound, and the patient made a good recovery. She left the hospital after seven and a half weeks. In April, 1895, the urinary trouble was the same as before, but the pain in the region of the hernia had disappeared. She now wears an elastic pad.

REMARKS.—Opening into the bladder may be avoided:

1. By constantly keeping the bladder in mind.

(a) When the hernial sac, after its neck has been loosened, isolated, and ligated, does not pass up readily through the internal ring, but stops in the canal.

(b) When, after pushing the ligatured neck of the sac up, the fibrous ring is not felt free all around, but a mass remains which fills the canal in its inferior medial or internal portion.

(c) When the sac cannot be readily isolated and the neck freed, but on one side resistance is met with by reason of adhesion to something in the para-peritoneal space. This adhesion is due to the fact, first, that the peritoneal covering of the neck of the bladder is adherent and cannot be stripped off sufficiently to form a neck; and second, that the peritoneal surface of the bladder in hernia is not neck-shaped, but is a broad surface, or rather that the presence of the bladder with its broad back clad with peritoneum which is adherent, and thus immovable against the bladder-wall, does not permit the formation of a narrow neck for the sac; it forms folds simulating separate hernial sacs.

(d) When separate sacs are encountered, whether empty or filled, suspect that this is a traction phenomenon, and examine for bladder. In short, when there is irregularity or difficulty in isolating the neck or in getting a well-shaped narrow neck, be suspicious of the bladder. It is only necessary to think of the bladder to avoid opening into it, unless its wall is so thin that it is teased or torn open in dissecting off or removing para-peritoneal, or in this case para-vesical, lipomata or islands or lumps of adipose tissue.

(e) In vesical hernia the usual treatment of the neck of the sac, as in the ordinary radical operation, namely, isolation, transfixion, and ligation, cannot be carried out as the sac has no narrow neck. There is only a slit-shaped opening into the peritoneal cavity which must be closed by sutures.

(f) Be careful in removing or dissecting off lipomata, as the bladder is often thin walled.

CASE II. *Synopsis. Left femoral hernia of five years' standing; right femoral hernia of six months' standing; the left femoral hernia becoming gradually irreducible and painful; radical operation for the hernia on the left side; bladder recognized, demonstrated by passing urethral steel sound from the bladder out through the crural ring, and vesical hernia reduced.*—Mrs. M. M., aged fifty-

one years, was admitted to Mercy Hospital February 10, 1894. Family history negative. Patient was well up to the birth of her last child, eight years ago, which was attended by lacerations of cervix and perineum. Soon after she was troubled with supposed stone in the bladder, but no operation was performed on bladder, cervix, or perineum. Five years ago she began to have soreness in the region of the left groin, and noticed a slight swelling in the left femoral region. This gradually increased in size until a year before she came under observation; since that time it has not increased. In the autumn of 1893 the patient noticed a tumor in the right femoral region, which was reduced by taxis. At the same time an attempt was made to reduce the tumor on the left side by taxis, but on coughing it became larger, and patient experienced pain of a darting character. She has never worn a truss or support of any kind excepting an extemporized cloth pad.

Operation, February 15, 1894. Upon examination in ether narcosis I found a left femoral hernia the size of a large hen's egg, situated below Poupart's ligament. The tumor feels like omentum. Percussion dull. The hernia was irreducible, but Dr. Morgan stated that he had partially reduced it four days before. An incision four inches long was made half an inch below and parallel to Poupart's ligament through the skin, subcutaneous tissue, and fascia. The sac-wall was thin and transparent, and I could see omentum through it. The sac was now opened, no hernial fluid escaped; the omentum was reddish, thick, hard. The omentum was loosened from the inside of the sac, and three band-like adhesions between the omentum, and neck of the sac divided. Still I could not reduce the omentum. I pulled out more omentum, but at the medial border of the ring I could not move the omentum nor get my fingers around it on account of adhesions. The internal ring was narrow, and at its inner lower border there was a mass that I could not reduce. I then partially divided Poupart's ligament upward so as to get at the adhesions, and divided the sac at its upper surface. In this enlarged opening I found that the adhesions were between the omentum and peritoneum on the posterior surface

of the bladder. On pulling the adhesion out into view I found a sac or corner of the bladder filling the medial and lower aspect of the crural ring. The adherent omentum was loosened and the omentum was now freely movable. The thickened extra-hernial omentum was divided into three portions, each of which was successively transfixed, ligated and cut, and the ends replaced in the abdomen. I then attempted to isolate the neck of the empty sac for ligature and extirpation by grasping the borders of the opening in the sac with four artery forceps and holding them forward, whereupon I found a body or mass on the lower wall of the sac, which I suspected to be the bladder, because it adhered to the extra-peritoneal surface of the sac, felt like a fold of the bladder, and because I thought I could see the the contour of the upper convex border of the bladder through the peritoneal covering of the peripheral portion of the opened sac. To make sure, I introduced a male steel sound into the bladder through the urethra, and easily brought its tip out through the canal into the mass, thus easily demonstrating that this was a vesical hernia. The peritoneal opening was now united by suturing the peritoneum on the posterior surface of the bladder to the peritoneum of the abdominal wall by a continuous silk suture. The slit was transverse and two to two and a half inches long. The hernia of the bladder was now reduced by pushing it into the abdominal cavity behind the crest of the pubes. The crural ring was closed after the method of Bassini. The corners of the external wound were now closed by deep sutures, the middle of the wound, a space an inch and a half long, being packed with iodoform gauze. The usual dressings were applied. The patient made an uneventful recovery.

REMARKS.—1. Vesical hernia might have been suspected from the previous symptoms referable to the bladder.

2. The fact that in an operation two weeks previous I had opened the bladder, put me on my guard and prevented a repetition of the accident.

3. During the operation I remarked, "When a hernia presents something unusual, a strange irreducible extra-peritoneal

mass, the experienced operator thinks of the bladder and inserts a sound, bringing its tip up into the ring.

4. To avoid opening into the bladder, think of the bladder while operating.

CASE III. *Synopsis. Strangulated left inguinal hernia; no vesical symptoms, although irreducible hernia had existed for many years; during operation, vesical hernia found behind incarcerated intestine, and recognized by a steel sound in the bladder; recovery.*

—V. F., an Italian, aged thirty years, bartender, was admitted to the German Hospital March 6, 1895, suffering from an incarcerated left inguinal hernia the size of a large orange. Efforts at reduction without anæsthesia had been made without avail. The tumor was dull upon percussion, and the patient stated that it had been present for many years, but had always been irreducible.

The patient was immediately prepared for operation, etherized and placed in the dorsal position. I attempted to reduce the hernia for about ten minutes, but was unsuccessful.

Operation. Incision seven inches in length over the hernia. The distended hernial sac presented in the wound, was incised and found to contain about four ounces of reddish-brown fluid. Cultures were made from this fluid, but with negative results. The hernial sac contained about six inches of small intestine. There was deep congestion of the vessels, but no signs of gangrene. The constricting portion of the ring was cut and the intestine replaced. In the upper medial part of the sac, I found a flat, tongue-shaped tumor one and one-quarter inches long resembling a lipoma. A sound passed up into the apex of the bladder passed into this mass, and thus proved that it was a diverticulum. The vesical hernia was now replaced in the abdomen, and the internal ring nearly closed by sutures, which brought the fascia together. The wound was irrigated with warm boric acid solution. I next united the fascia of the external oblique, and passed a thick strip of iodoform gauze subcutaneously down to the middle of the scrotum, where an incision was made and another heavy gauze drain passed up subcutaneously to a point a little above and internal to Poupart's liga-

ment. Another heavy strand of gauze was packed in the middle of the wound and skin sutures applied. The hernia was direct, and had probably never been entirely reduced. The diverticulum of the bladder was first forced down, and became a predisposing cause for the intestinal hernia, which was forced down during an attack of coughing.

REMARKS. The strangulated loop of small intestine was congested, but viable, and, after being washed, returned to the abdomen. No omentum was found, but in the inner, medial, and lower aspect of the inguinal canal there was a small lipoma-like mass extending like a tongue down into the lower posterior part of the hernial sac. I first thought of omentum, but it was smooth; then of a para-peritoneal lipoma, but it was flat, with a broad base; I also thought of the bladder, and, to find out the relation of the tumor to the bladder, I introduced a sound into the latter, and found that the tumor was hollow and empty, and was a flat, empty diverticulum or prolongation of a corner of the bladder, resembling the cornu of a uterus bicornis.

The diverticulum was a smooth, yellow tongue-shaped flat mass, an inch and a quarter long and an inch broad. When taken between the thumb and finger it feels like an empty glove finger, and its walls appear to be half a centimetre to one centimetre thick. A curved steel sound was passed into the bladder, but its end could not be brought up and out of the inguinal canal. The diverticulum could now be inverted an inch and a half into the lumen of the bladder, and the end and curve of the sound could be easily made out. I could pass the diverticulum by pressing the corner of the bladder down over the end of the sound, so that the curved end of the sound was inside the diverticulum in its whole length for over an inch, and its tip was at the apex of the diverticulum.

I might have filled the bladder with water and made the diverticulum stand out of the inguinal canal like a thumb, for demonstration to the students, but for my own diagnosis this was not necessary.

I reduced the diverticulum; that is, I replaced it, pushing it

into the abdomen behind the internal opening of the inguinal canal.

CASE IV. *Synopsis.* *Left scrotal vesical hernia of fourteen years' standing, finally becoming irreducible and causing difficulties in micturition and transient hæmaturia and cystitis; operation refused.*—D.C., dry goods merchant, aged fifty-nine years, consulted me in May, 1895. Family history negative. Had ordinary children's diseases, no venereal disease. Patient is married and has six healthy children. The present trouble began in 1881, when he occasionally experienced severe pain in the inguinal region after walking, which persisted until he sat or lay down. Upon examination he found a tumor, the size of a hen's egg, in the left inguinal region. This could be forced back when he stood up, and disappeared spontaneously when he lay down. He consulted a physician, who diagnosed inguinal hernia, and prescribed a truss. The truss gave relief until a year ago, when, upon coughing, he felt pain in the left inguinal region. About the same time he noticed that his urine was bloody, especially after he had walked. If he remained perfectly quiet there was, as a rule, no blood in the urine. He had no pain referable to the bladder.

He consulted me, and I prescribed for him, and after three or four weeks the hæmaturia disappeared, and has not since returned.

About a year and a half ago the hernia commenced to increase in size and extended slowly down into the scrotum. The pain was very severe when he walked without his truss. In February, 1895, he ceased to wear the truss.

About five weeks ago the urinary difficulty became prominent. Just before urinating the tumor would become enlarged and tense, but would reduce in size and become soft after urination. He was obliged to urinate about every two hours; although there was still some swelling, he felt that the bladder was emptied at each urination.

At present the hernia increases in size prior to urination, and partly or entirely disappears after urination. The patient wears

no truss, and, unless he walks too long—an hour or more—has no pain. When he stands too long he has a sensation of weight in the scrotum, which passes away when he sits down. The hernia is irreducible, but otherwise the patient is in good health, and does not want any operation.

III. The cases most rarely met with are those in which there is no sac at all, the protruding portion of the bladder being entirely extra-peritoneal.

SYMPTOMS.—The classical symptoms of hernia of the bladder, such as disturbance of urination, the patient having to press on the hernia to empty the bladder, or fluctuation, the hernial tumor increasing in size before urination, are met with only in very pronounced cases, where a large portion of the bladder enters the hernia. There is, of course, no difficulty in the diagnosis of cases of this kind.

In only a few of the cases encountered during operations for hernia, vague subjective vesical symptoms had been observed, which caused suspicions of vesical hernia. In the majority of cases there are no vesical symptoms at all, since, when a vesical hernia is small, it gives no distinctive symptoms. A symptom of possible value is the pain and tenderness in the almost always irreducible hernia; but if this pain does not radiate downward in the direction of the bladder it is of little value in distinguishing between the bladder and other contents of the hernia.

It is important to know the different aspects under which the bladder presents when unexpectedly encountered during the operation for hernia. In this connection the distribution of the adipose tissue surrounding the bladder is of interest. Sometimes there is no adipose tissue at all, and the bladder-wall then presents the well-known network of muscle fibres. There is more frequently, however, a layer of adipose tissue surrounding the wall of the bladder. This adipose tissue may be a uniform, thin, smooth layer under the peritoneum, as in my third case, or a uniform layer covering the extra-peritoneal portion of the bladder, or, as is most common, the adipose tissue forms irregular, smaller or larger, often multiple lipomatous masses, such

as are found everywhere near the peritoneum. In exceptional cases these lipomatous masses attain considerable size, but ordinarily they vary in size from a hazelnut to a walnut. Roux found an adipose mass 6 to 7 cm. in diameter, not clad with peritoneum, and supposed it to be degenerated omentum. Lucas-Champonnière found an adipose mass below the hernial sac, which he believed to be a second hernial sac. Monod<sup>16</sup> found a large adipose mass, not resembling omentum, which was a lipoma covering the prolapsed corner of the bladder. Lanz<sup>13</sup> found a mass the size of a pigeon's egg, looking like a subserous lipoma, on the posterior side of the hernial sac. Similar adipose masses were found in 11 out of the 27 cases tabulated by Lejars.<sup>14</sup>

In the cases where no lipomatous masses were found the bladder presented in various ways. Berger found a bluish-gray dense nodule the size of a hazelnut, adherent to the under surface of the sac. Lanz<sup>13</sup> observed a bluish, transparent mass 1 cm. long, resembling a duplication of the hernial sac. Walther found a voluminous cystic pouch coming out from the medial corner of the inguinal canal. Postempski<sup>17</sup> describes a mass which looked like a thickened hernial sac, but upon dissection he saw the muscular fibres of the bladder, and Krönlein reports a case in which a similar appearance enabled him to make a diagnosis of hernia of the bladder.

In other cases, in the attempt to isolate the sac for ligation at the neck, there was found only a thickening of the neck on its inferior medial aspect, as in Boeckel's case, cited by Hedrich,<sup>8</sup> in which this part of the sac was thick, soft, and fleshlike, and in which he recognized the muscle fibres of the bladder and avoided opening it.

It will be seen that we cannot expect the diagnosis to be made before operating; in exceptional cases only, one or another vesical symptom leads to a suspicion of vesical hernia. But a suspicion is in itself an advantage, as it calls attention to the bladder, and merely thinking of the bladder during the radical operation for hernia may prevent the operator from wounding it. Thus, for instance, Boeckel, Lanz, and myself, after wound-

ing the bladder in our first cases, avoided this accident in our subsequent cases by simply bearing the bladder in mind when some unusual appearance presented in the hernia.

We have two methods of positive diagnosis during operation: First, injection into the vesical hernia by filling it from the bladder; and second, introduction of a sound through the extra-hernial into the intra-hernial portion of the bladder.

Injection of the intra-hernial portion of the bladder is an excellent means of diagnosis when it succeeds. In most of the cases, however, the ring is so narrow that the fluid from the bladder does not enter the hernial portion. Monod<sup>16</sup> suspected a hernia of the bladder before the operation, but injection proved negative at this time. Injection during the operation, when the conditions led the operator to think of the bladder, also proved negative until the ring had been divided, in Krönlein's, Boeckel's, and Monod's cases. Consequently filling the hernial portion of the bladder, to be proof positive, must be preceded by free division of the ring, and this can always be done safely in an upward direction.

A curved metal sound passed into the bladder, and from the bladder out into the hernial portion, has proved an excellent means of diagnosis in the cases operated upon by Roth,<sup>19</sup> Kummer,<sup>12</sup> and myself. For this procedure, however, it is also necessary to have a wide ring or to divide the ring as in Roth's and my own case. Sometimes the end of the sound can be passed out into or through the canal, as in my case of femoral hernia. If the sound cannot extend as far as this, a finger passed down through the widened ring will meet the tip of the sound in the bladder, and the hernial portion of the bladder, when made movable, can be pushed down over the sound, as in my case of inguinal hernia.

I can see no objection to dividing the ring sufficiently for the introduction of a finger for diagnostic purposes, since this division has, as a rule, to be made in order to enable the operator to reduce the prolapsed bladder, and since the divided ring can easily be reunited after reduction of the hernia. Lanz<sup>13</sup> is hardly right when he argues against this procedure, which he calls

laparo-herniotomy, as a dangerous addition to the operation, and his argument is incomplete when it is remembered that in all operations for hernia we do not hesitate to divide the ring sufficiently for exploration and operation to secure a normal condition of the reduced contents of the hernia, division of adherent omentum or loosening of intestinal adhesions to the intra-peritoneal portion of the ring.

Digital exploration through a wide or divided ring, as practised by Walther, will also help in the diagnosis of hernia of the bladder when it is seen that a mass or sac found in the hernia leads down behind the symphysis toward the bladder, but is, of course, less positive than when combined with examination with the sound. But even examination with the sound has sometimes proved negative, as in Postempski's<sup>17</sup> case, in which he recognized the muscular fibres of the bladder, introduced a sound, found that he could not pass it up into the suspected mass, concluded that his suspicion was unfounded, and opened into the bladder.

In large vesical hernias with typical symptoms, the diagnosis is, of course, not very difficult, but such cases are comparatively rare, as in sixty-five operations collected by Siegel,<sup>21</sup> in which vesical hernia was found, diagnosis prior to operation was made in only 12 cases.

The bladder has been frequently wounded during the radical operation for hernia. Lejars,<sup>14</sup> in 1893, collected 20 cases, in 15 of which the wound in the bladder was immediately recognized; in the remaining 5 cases the wound of the bladder was not recognized until later. Besides the cases of Israel, Berger, Guelliot, Aue, and Jungengel, cited by Lejars, there are on record the cases of Leszinsky,<sup>15</sup> and Habs,<sup>9</sup> and Reverdin<sup>18</sup> found on microscopic examination of the sac by Zahn that the sac was partly bladder. In these cases the diagnosis is either made when the urine shows in the dressings or when tenesmus and hæmaturia occur.

It is, of course extremely difficult to make the diagnosis in cases of vesical hernia with no sac. Thus Aue, in a case of femoral hernia, found no peritoneal covering, and supposed the

bladder to be the hernial sac. He then made an incision above Poupart's ligament into the abdominal cavity, and attempted to make digital exploration of the sac, but found no opening. Jungengel had a similar experience, in which he took the bladder for an empty sac, ligated it and cut it off without seeing any other sac. He must have opened a fold of peritoneum, as when reopening of the wound became necessary two days later, on account of hæmaturia and tenesmus of the bladder, a large amount of blood was found in the peritoneal cavity.

The danger of wounding the bladder is not so great as would naturally be expected. Six patients out of the 20 cases of bladder wounds collected by Lejars<sup>14</sup> died, but the cause of death was almost invariably independent of the wound of the bladder, such as strangulation of the intestine, hemorrhage, pneumonia, embolism, etc. In the majority of the cases in which the bladder is healthy, the wound heals, usually after a temporary fistula has existed for a variable time, weeks or months. The fistula has also healed in cases in which the bladder was not recognized. When the bladder wound was recognized and sutured a temporary fistula usually formed; Lejars found primary union in only two out of nine cases of primary suture.

The prognosis of femoral hernias, of which Guépin,<sup>6</sup> in 1893, collected 8, and to which I have added 2, was as follows: With the exception of Livret's case, which was not operated upon, all were discovered accidentally during the operation. The bladder was opened in 5 cases, those of Habs, Güterbock, Lanz (first case), Aue, and my first case. It was not opened in Cooper's, Lanz's second case, Schoonen's, and my second case. The wound in the bladder healed without a fistula in Lanz and my case. A temporary fistula formed in the cases of Habs and Aue, and only one of the patients, namely, Güterbock's, died, not at all from the wound in the bladder, but from an entirely independent perforation of a diseased intestine.

**TREATMENT.** Hernias of the bladder which have given symptoms sufficiently distinct for certain diagnosis have been treated by replacement when this was possible, by being left alone as

not being imminently dangerous to life, or, finally, have been operated upon. Early operation, when the diagnosis can be made, is advocated, since the vesical hernia is likely in the course of time to cause cystitis, and finally ascending pyelitis and nephritis. Thus Justo<sup>11</sup> (cited by Lejars) operated upon a large vesical hernia in a case in which the patient had himself made the diagnosis from the difficulty in urination three weeks after symptoms of strangulation had disappeared by taxis. He excised the sacculated portion of the bladder 6 cm. in length, and sutured the wound in the bladder, which was 8 or 9 cm. long.

In a great majority of cases, however, an operation on the bladder is not planned, as no diagnosis has been made. The question as to the treatment of the bladder accidentally met with during operations for hernia is twofold: First, how to treat the bladder when it is recognized and not yet opened, and, second, what to do when the bladder is accidentally opened.

When hernia of the bladder is recognized during operation the operator will, as a rule, avoid opening into the bladder and limit himself to replacement of the prolapsed portion within the abdomen. But here the question has been brought up, as for instance, by Monod<sup>16</sup> and Délagenière<sup>3</sup>, whether it is not better to extirpate the prolapsed portion of the bladder, as it often forms a diverticulum with weakened muscular walls and covering lipomatous masses. They fear that a diverticulum of this kind may cause, by reason of incomplete evacuation, retention, cystitis, and even formation of calculi, and, as accidental wounds in healthy bladders have healed so readily, they consider extirpation of the hernia as possibly safer for the patient. It is not advisable to formulate a general rule in this respect, because most of the smaller vesical hernias do not have the shape of a diverticulum with a narrow neck, but when the hernia is loosened we find the bladder-wall at this point drawn out to some extent, but the communication at the base is usually broader than the middle of the prolapsed portion. Therefore, in the majority of cases the prolapsed portion of the bladder when reduced will not be the seat of retention.

Extirpation of the vesical hernia will always prolong the operation, and inasmuch as primary union seldom takes place, it necessitates so much effective deep drainage of the bladder-wound that it must of necessity interfere with the course of the modern radical operation. When the wound in the bladder has to be drained the successive layers of the canal cannot be closed, as in Bassini's operation. Thus the result of the radical operation for hernia, namely, the prevention of relapse, is to some extent jeopardized. Furthermore, the necessity of either a permanent catheter in the bladder, or, at all events, frequent catheterization, is a disagreeable and possibly dangerous element in the after-treatment, and finally, the urinary fistula, although only temporary, takes weeks or months to close.

On the other hand, if the prolapsed bladder is reduced without opening, there is no interference with the typical short aseptic course of the radical operation for hernia. Monod,<sup>16</sup> in his own case, having made the diagnosis during the operation, replaced the unopened bladder. Lanz<sup>13</sup> also did this in his second case, but he deliberated upon the advisability of making the diagnosis positive by opening into the bladder. The other operators who have made the diagnosis during the operation before opening into the bladder have rejoiced at being able to replace the bladder without wounding it.

When the bladder has been opened there is little controversy as to the treatment of the wound. A double or triple row of extra-mucous sutures should be applied. When the wall of the bladder at the border of the wound is torn or very thin, some of the operators have excised a portion of the lipomatous area, so as to be able to apply the sutures in a thicker and more nearly normal bladder-wall. This is a very rational procedure, inasmuch as experience has taught us that even careful primary suture of the bladder-wall does not always secure primary union, but that slight leakage follows in the majority of cases. It therefore seems advisable to do as I did in my first case, namely, to anchor the wound of the bladder by a temporary suture to the deepest part of the ring. If, as happened in my case, no leakage takes place, the anchoring suture has done no

harm; if leakage takes place it may lead the urine out through the wound and prevent it from entering the peritoneal cavity.

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